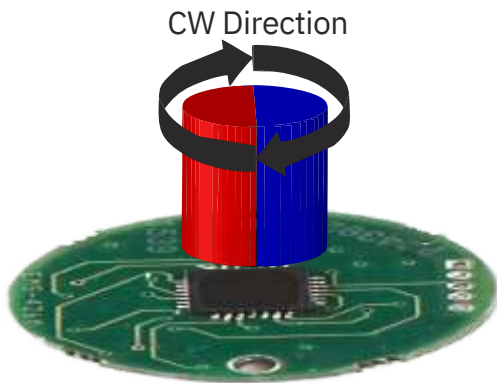


MDB20 - Magnetic encoder module

Based on Dipole Magnet and Hall Sensors



MDB20 magnetic rotary encoder module has a precision sensor having an integrated Hall element for scanning a permanent Dipole magnet. The Sensor itself generates a constant amplitude Sine and Cosine voltages that is used for angle calculations. These Sine and Cosine signals are further interpolated to get the Incremental or Absolute signals with resolutions up to 14 bits per rotation. MDB20 module is a 20mm PCB assembly which can be used in any small designs with ease of installation.

Salient Features:

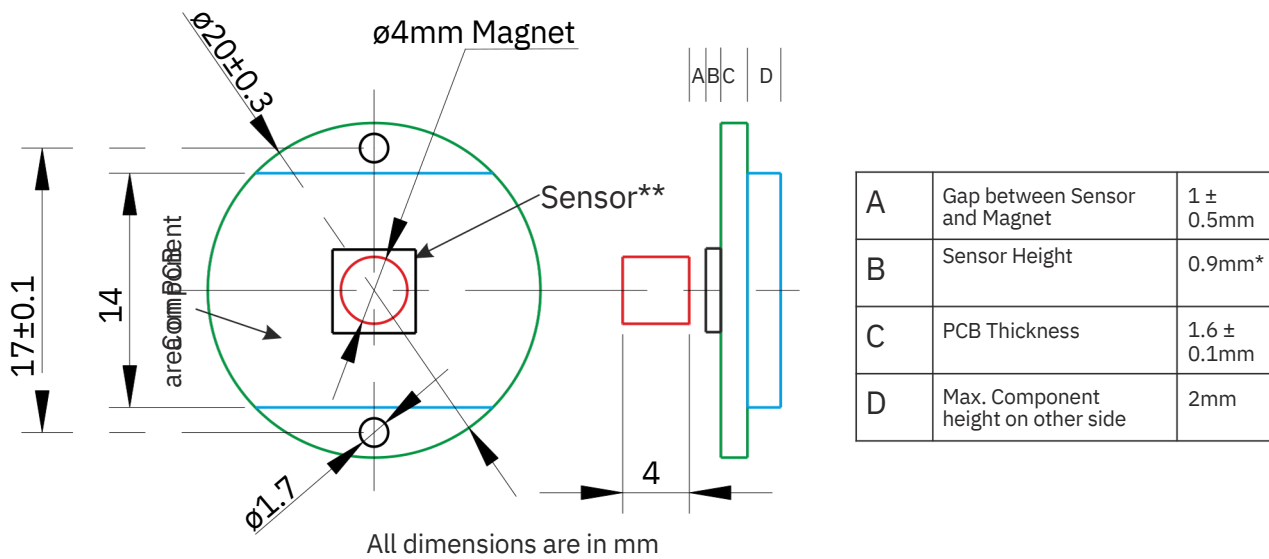
- 👁️ **20mm Circular PCB assembly module Operates on 5V power supply**
- 👁️ **Variety of outputs supported like Analog Sin-Cos output, Incremental RS422, Absolute SSI and BiSS-C protocol**
- 👁️ **Supports up to 14 bits (16384 positions) per rotation**
- 👁️ **Absolute and Incremental output**
- 👁️ **Accuracy +/- 0.5 deg**
- 👁️ **High Speed operation up to 20000 rpm at finest resolution**
- 👁️ **3600 CPR also available to give angular resolutions easier for mathematical calculations**
- 👁️ **Suitable for applications like motor control, Medical instrumentation, paper and textile industry, Industrial automation and many more**



Available models:

- 👁️ **MDB20AS** - Analog single ended Sine Cosine output with a single sine-cosine cycle per rotation
- 👁️ **MDB20AC** - Analog complementary Sine Cosine output with a single sine-cosine cycle per rotation
- 👁️ **MDB20LV** - Analog Linear voltage output with 10bit resolution
- 👁️ **MDB20IR** - Incremental RS422 A, B and Z output with up to 16384 counts per rotation (CPR)
- 👁️ **MDB20SB** - Absolute output on Synchronous Serial interface (SSI) with Binary data up to 13 Bits per rotation
- 👁️ **MDB20SG** - Absolute output on Synchronous Serial interface (SSI) with Grey coded data up to 13 Bits per rotation
- 👁️ **MDB20BC** - Absolute output on BiSS-C data up to 14 Bits per rotation

Installation drawings:



Note: Magnet center axis and PCB center should be within $\pm 0.2\text{mm}$ to get the specified accuracy results

MDB20 Specifications:

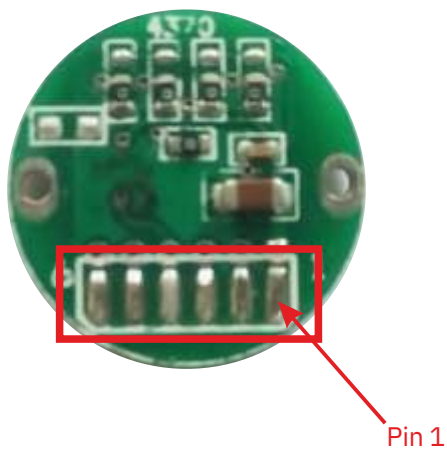
	MDB 20AS / AC	MDB20IR	MDB 20SB / SG	MDB20BC
Power Supply (Vdd)			+5V DC ($\pm 5\%$)	
Current consumption	50mA maximum		90mA maximum	
Output	AS-2Vpp each single AC-0.5Vpp each signal	Incremental		
Maximum RPM	120000 RPM	2500 to 120000 RPM		
Operating Temperature	-40°C to +125°C			
Storage Temperature	-40°C to +125°C			
Accuracy	$\pm 0.5^\circ$			
Clock Frequency	Not Applicable		4MHz maximum	10MHz maximum
Output data format	Not Applicable		SB - Binary SG - Grey coded	BiSS-C
SSI Data time out	Not Applicable		16 μs	12.5 μs to 40 μs
Output driving current	20mA maximum			

Pin Connection details:

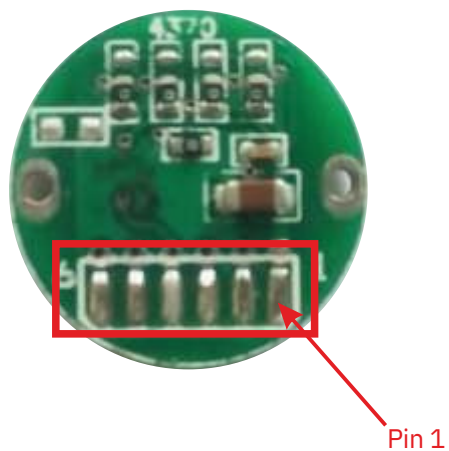
(Pin number "1" marked on the PCB)

Pin No	MDB20AS	MDB20AC	MDB20IR	MDB20SB/SG/BC	MDB20LV
1	Vdd	Vdd	Vdd	Vdd	Vdd
2	GROUND	GROUND	GROUND	GROUND	GROUND
3	SIN +	SIN +	A +	Data +	Vout
4	COSINE +	COSINE +	A -	Data -	
5		SIN -	B +	Clock +	
6		COSINE -	B -	Clock -	
7			Z +		
8			Z -		

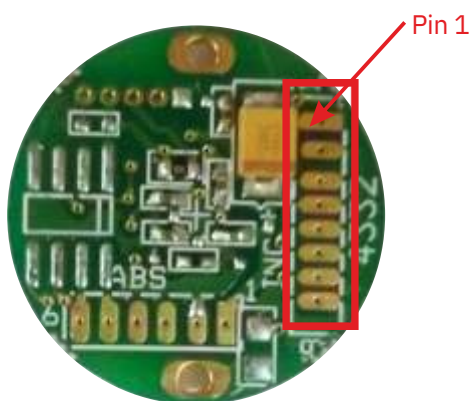
MDB20AS



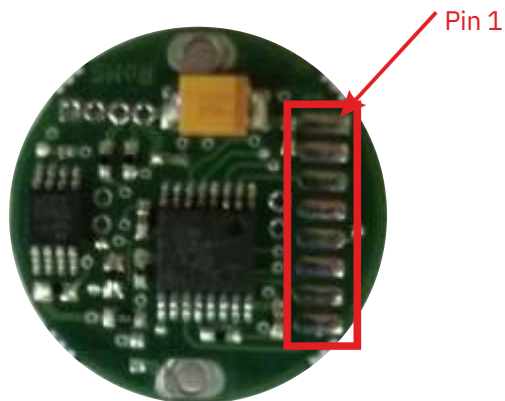
MDB20AC



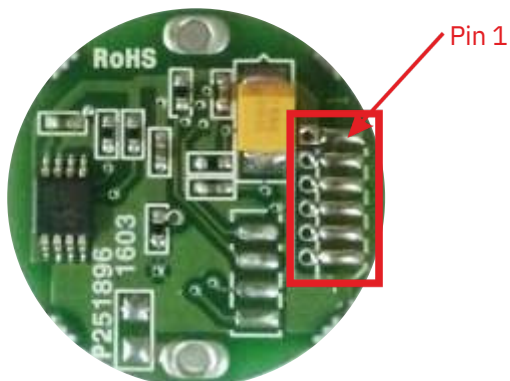
MDB20IR (up to 12bit)



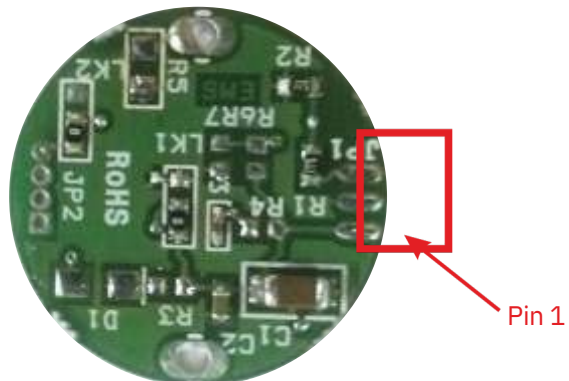
MDB20IR (for 13 and 14bit)



MDB20SB/SG/BCBC

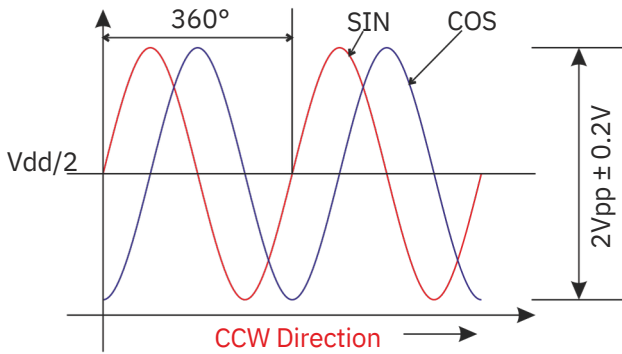


MDB20LV

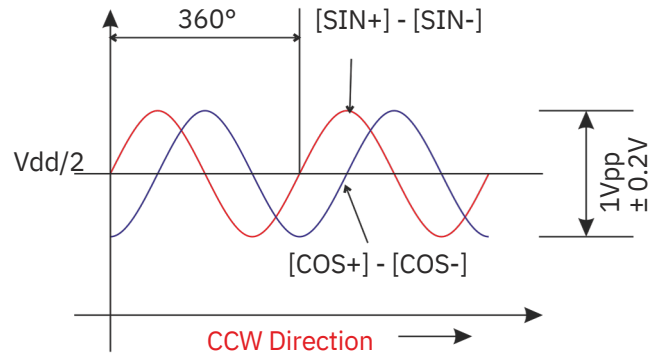


Output waveforms:

MDB20AS

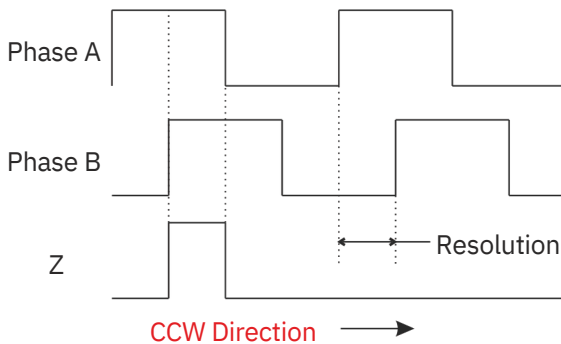


MDB20AC



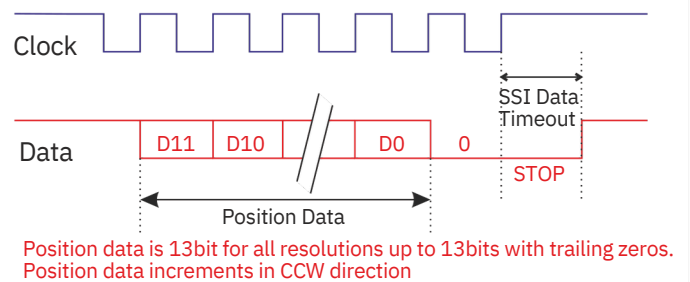
MDB20IR

(Differential signals are not shown)

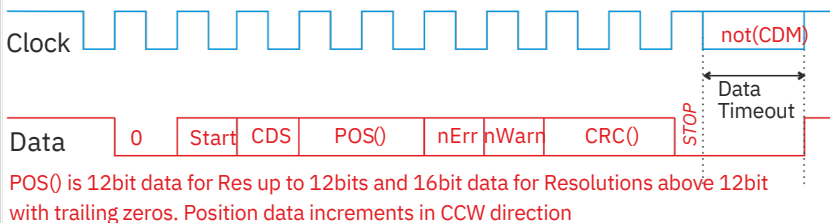


MDB20SB / SG

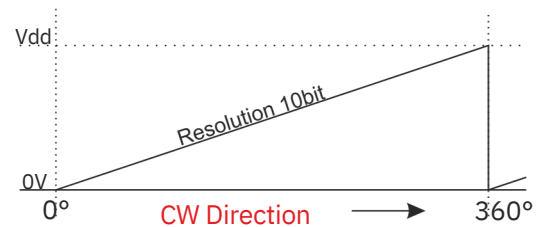
(Differential signals are not shown)



MDB20BC



MDB20LV



Output Resolutions:

MDB20IR

CPR	Hysteresis	Max. RPM
4 to 256*	0.7°	120000
260 to 512*	0.35°	60000
516 to 4096*	0.17°	30000
8192	0.17°	5000
16384	0.17°	2500

MDB20SB / MDB20SG

No of Bits	Hysteresis
9	0.35°
10 to 13	0.17°

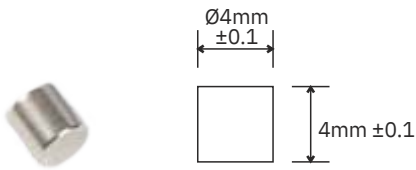
MDB20BC

No of Bits	Hysteresis
8	0.7°
9	0.35°
10 to 12	0.17°
13	0.17°
14	0.17°

* - In increments of 4. Eg 4, 8, 12, till 256 etc

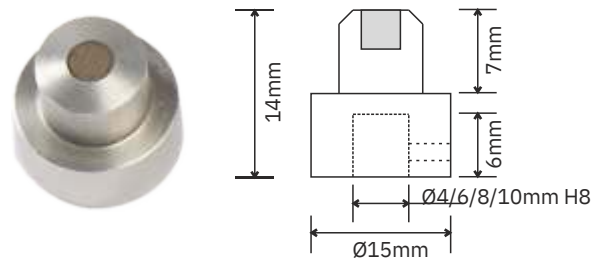
Note: Pulse per Rotation (PPR) can be calculated as counts per rotation (CPR) \div 4

Magnet



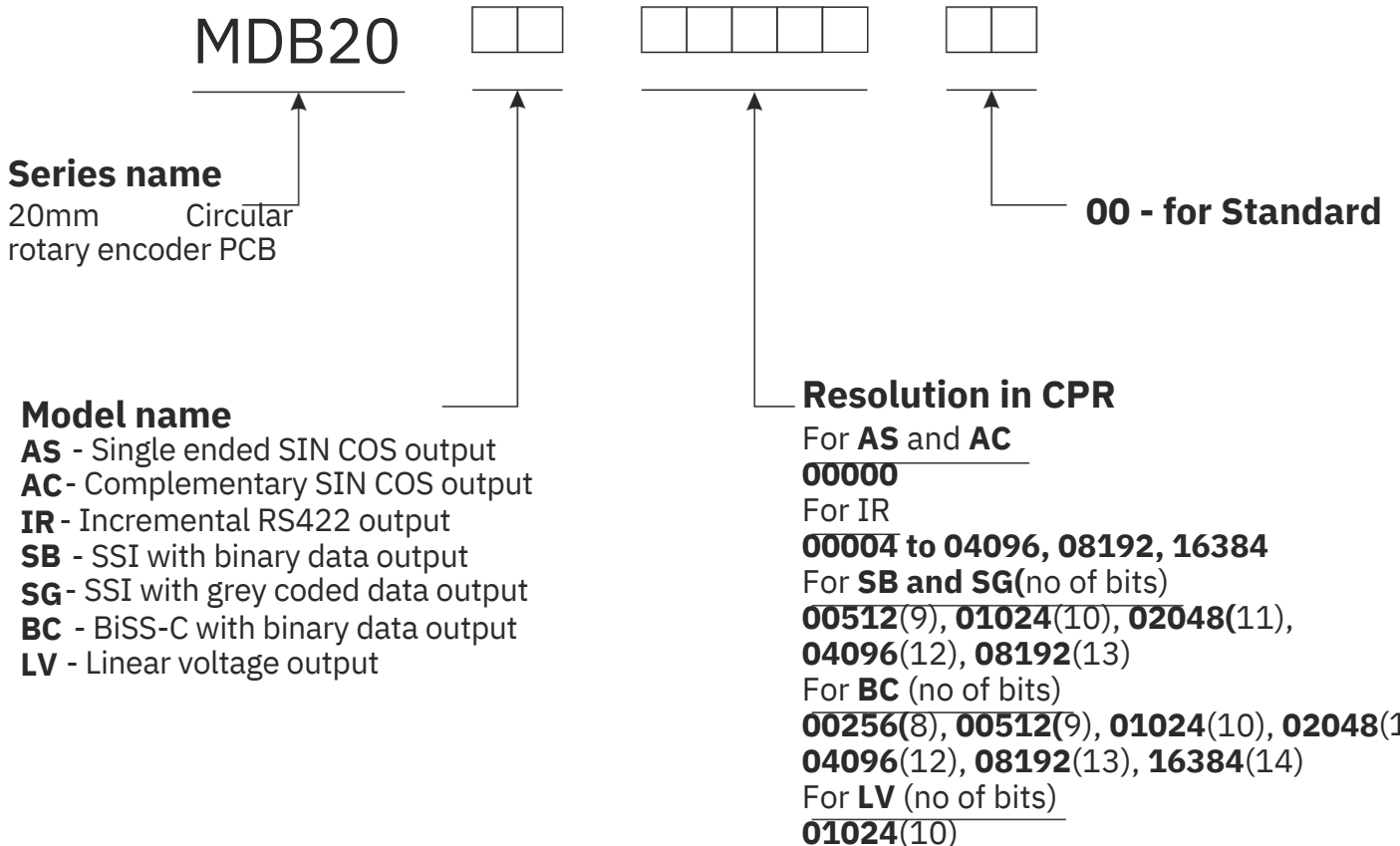
Order code - MDG04
Note: Magnet should be glued on a non-magnetic material

Magnet with Holder



Order code - MDH04 / 06 / 08 / 10
Note: M3 Grub screw is provided on the holder for fixing on to Shaft

Ordering Information:



Head office and Factory :

Electronica Mechatronic Systems (I) Pvt. Ltd.

Unit No. 37 & 44, Electronic Co-op. Estate, Pune-Satara Road, Pune
411009 India
Tel.: +91-20-2422 4440, 2422 2293
Fax: +91-20-2422 1881
Email: enquiry@electronicaems.com
Web: www.electronicaems.com